CHAPTER 17

SITE VALUATION

17-1. Evaluation.

a. Dredging in our Nation's waterways and harbors is necessary to maintain navigation. However, the costs of dredging can sometimes be justified by documenting the benefits that can be derived from a network of navigable waterways. Tangible dollar benefits are generally savings in shipping costs realized by shippers using the waterways. In addition to dredging costs, the costs of disposal of dredged material from waterways are substantial. In conventional disposal operations potential benefits are usually ignored, and the cost of the disposal operation is simply part of the total cost of the entire dredging-disposal project.

b. Dredged material can provide socioeconomic benefits if beneficial uses are implemented. Uses of either the material itself or the containment area in which it is placed are options. Land enhancement benefits from the placement of dredged material can be substantial, and highly productive habitat can be developed on disposal sites. The value of new or filled land or a wetland or other habitat created by disposal of material dredged from a project is a valid benefit that can be credited to the overall project. Both new and maintenance dredging projects should evaluate land enhancement and beneficial use alternatives. An analysis should also be made of the associated socioeconomic benefits and costs of the disposal of dredged material. This process should consider several alternatives for disposal including beneficial uses, and should consider all benefits and costs, tangible as well as intangible. A number of factors need to be considered in benefits, including attitudes and opinions of local citizens, resource agencies, and environmental groups, the general public good, and distinguishing or limiting historical or archaeological features.

c. To aid in the evaluation of the land enhancement value and associated benefits that can be derived by the beneficial use of dredged material containment areas, a land value methodology has been developed for certain types of beneficial uses. The methodology is basically designed to provide guidance for projects still in the early planning stages and produces estimates of the direct market value of the created land, the related community benefits, and adverse impacts from the land use. The use of this methodology can help highlight the many advantages of the beneficial land use of dredged material. Project sponsors and local officials may gain wider public support for beneficial use projects if they can effectively demonstrate to the community the full range of benefits from project implementation.

17-2. Methodology.

a. Basis of Appraisal. The basis for the land value portion of the methodology is the comparable sales approach often used in real estate

appraisal. This approach was considered the most appropriate for the value estimate of newly created land from dredged material. For the assessment of associated benefits and adverse impacts resulting from the land-use project, a matrix has been devised to categorize and describe all relevant effects. The methodology itself can be divided into: site description, establishment of use potential, estimate of value, and associated benefits and adverse impacts. The first three collectively estimate the site value changes; the fourth identifies the associated benefits and/or adverse impacts of the land-use project.

b. Site Description. Before an analysis of the value of a site can begin, the site must be described in terms of its physical features, environmental setting (including natural and man-made areas), and relationship to the economic structure of the area. This phase of the methodology is primarily a data base for subsequent analyses. Many of the items of importance to the value of the prepared site will emerge during the course of this data-gathering task. Taking the required time to develop the data needed for this section of the methodology, the final estimate of value can be made with more confidence.

c. Establishment of Use Potential. This section of the methodology establishes the most likely and the highest and best use of the containment area after the dredged material has been placed, dewatered, and consolidated. Normally, the highest and best potential use of a piece of land, within existing legal and institutional constraints, is used as the basis for the value assessment. Values of comparable land in the area determine the value of the new piece of land. The use potential is established by identifying current land uses surrounding the site, the need for certain land uses within the area, the zoning intensity of various levels of development, and other institutional and legal constraints. Also, the physical characteristics previously identified must be considered. For example, a disposal site made of fine-grained dredged material will not be suitable for high-rise developments despite other positive attributes, but it may have use as a recreation site where low-load structures may be safely erected, or as a wildlife habitat and nature area. Finally, the accessibility of the site to the existing infrastructure is an important determinant of practical use potential.

d. Estimate of Value.

(1) This is the final stage of the methodology in the actual site valuation process. For the successful accomplishment of a value estimate, an economist or real estate appraiser familiar with land values should be involved. Three key functions must be performed in the estimation process:

(a) Land parcels similar to the site to be created by the containment area and for which there are recent sale or assessment data must be identified.

(b) An estimate of demand or need for the new site must be made based on the information obtained in the estimate of use potential.

(c) The relative applicability of the comparable sites versus the new site for beneficial uses must be determined.

(2) Values of comparable parcels are the basis on which the market value estimate is made. Once the comparables have been identified and their value established, a utility estimate is made to determine how similar, with respect to "value-producing" factors, the comparables and the new site are. If the comparables and the new site are similar with respect to accessibility, zoning restrictions, proximity to public services, foundation constraints, etc., then the comparables can be considered to have equal utility to the new site and be used to establish site value. Using the relative utility measure and the demand for the new land use, an adjusted value for the new site can be estimated. By comparing this value estimate with the original value of the site before the dredged material was deposited, a land enhancement benefit can be estimated for whatever beneficial use that has been proposed.

(3) Before an estimated land valuation can be determined for other than upland human-use sites, values must be determined for such potential site uses as wetlands and other types of habitat development, nonconsumptive recreation, fish nursery areas, commercial and noncommercial shellfish and finfish industries, aquatic vegetation, endangered species critical habitat, water quality, and other difficult-to-estimate variables. These types of values are extremely controversial and hard to assess. None of the scientists working in their fields in the development of values agree on uniform estimates. Values often need to be assigned on a site-specific basis. WES has been coming to grips with this problem through the Dredging Operations Technical Support Program and Wetlands Research Program. WES often assists Districts in reaching estimated values of new or proposed dredged material or mitigated sites.

e. Associated Benefits and Adverse Impacts.

(1) The direct increase in market value of a site from the placement of dredged material is an important land enhancement benefit; however, the induced associated benefits and/or adverse impacts can also be substantial. These benefits and impacts may touch many different economic groups in a wide geographic range away from the site. The methodology can assist in identifying these benefits and impacts, describing their magnitude and significance, and displaying them for decisionmakers and the public.

(2) Two guides were developed by Conrad and Pack (item 15) to assist in identifying the significant benefits and impacts resulting from the beneficial use of dredged material containment areas. One guide graphically shows the relationships of various categories of effects which could result from a productive land use. The other lists specific types of social, economic, and environmental factors that might be affected by the beneficial use. These

guides are by no means all-encompassing but provide a framework for identification of the important benefits and adverse impacts.

(3) Once the benefits and adverse impacts are identified, a matrix can be used to describe and evaluate them. The matrix should have a simple structure, and the evaluation is based on the judgment involved in the process. No general weighting system was considered appropriate for the evaluation of these associated benefits and adverse impacts. However, a matrix should allow this subjective evaluation to be displayed so that other interested parties can review them. An important point should be remembered when using this methodology. The entire methodology is intended as a set of guidelines, and it involves the application of sound judgment in a multidisciplinary group. Deviation from the methodology may be warranted where sound judgment dictates that the situation being investigated does not lend itself to application of the methodology, such as when dealing with habitat applications of a site.

17-3. Case Studies. In developing the methodology, 15 case study sites were examined and the methodology tested on each (item 15). As developed, the methodology is to be used on undeveloped sites for planning purposes. Sites that were already developed were selected in the interest of getting a diverse group for testing. The results of the case studies indicated that the methodology is flexible and adaptable to a wide range of sites. Table 17-1 lists the case study sites along with their physical and dredged material characteristics. Table 17-2 shows the settings of the case study sites. Table 17-3 is a compilation of the estimated change in land values of the sites as a result of developing them for upland beneficial use. The values indicate that, through beneficial use application, dredged material containment areas can realize significant increases in value. The wide range of value increases shows that the value increase is a site-specific characteristic. The methodology, however, allows an estimation of this change before the site is developed. Table 17-4 is presented to show the types of associated benefits and adverse impacts that were encountered during the case studies. Details of the case studies are available in item 15.

17-4. Use of the Methodology. The large land enhancement benefits that can accrue from the beneficial use of dredged material make this alternative to conventional disposal particularly attractive. The methodology described in Chapter 17 is a tool that can be used in the planning stages to identify and evaluate both the tangible increase in market value and other benefits to be derived from beneficial upland land use. Use of this methodology can only serve to point out these benefits and/or adverse impacts so that appropriate disposal alternatives will not be overlooked. The methodology does not apply to sites not used as upland human-use sites such as wetlands. See para 17-2d(3) for a discussion of other site valuation.

Table 17-1

Case Study Site Physical and Dredged Material Characteristics (item 15)

Site	Location	Approximate Size		Soil Characteristics				Depth to Foundation Strata	
		ha	acres	Type	Grain Size	Bearing Capacity	Vegetative Support	m	ft
Anacortes	Anacortes, WA	11	26	Sand/ clay	Fine	Fair	Good	8	25
Artificial Island	Salem County, NJ	81	200	Silty clay loam	Fine	Fair	Good	21	70
Bay Port	Green Bay, WI	233	575	Sand/ clay	Fine	Poor	Good	5	15
E. Potomac Park	Washington, D.C.	133	329	Silt/ clay	Fine	Poor	Good	31	100
Fifth Avenue Marina	San Diego, CA	9	22	Fine sand	Fine	Fair	Good	NA	
Florida State Fairgrounds	Hillsborough Co., FL	112	276	Silt/ clay	Fine	Poor	Good	NA	
Hookers Point	Tampa, FL	162	400	Silt/ clay	Fine/ medium	Fair	Good	NA	
Hoquiam	Hoquiam, WA	18	45	Sand/ silt	Fine	Fair	Good	10	34
Patriots Point	Charleston, SC	182	450	Silty loam	Fine	Poor	Good	18	60
Vicksburg	Vicksburg, MS	142	350	Sand/ silt	Fine	Good	Good	12	40
Virginia Beach	Virginia Beach, VA	17	43	Sand & clay	Fine to medium	Fair	Poor	NA	
Pelican Island	Galveston, TX	1306	3225	Silt/ clay	Fine	Fair	Good	NA	
Port Jersey	Jersey City, NJ	172	430	Sand/ clay	Fine to medium	Fair	Poor	23	75
Blount Island	Jacksonville, FL	680	1700	Silt/ clay	Fine	Good	Good	25	80
Rivergate	Memphis, TN	172	425	Sand/ clay	Medium	Good	Good	NA	

Table 17-2

Case Study Site Settings (item 15)

Site Name	Productive Use	Water and Sewer	Urban Setting	Zoning	Access
Anacortes	Industrial/manufacturing	To site	Urban/port	Industrial/urban	Excellent
Artificial Island	Nuclear power plant	Home nearby; developed their own services	Rural	Industrial/urban	Poor
Bay Port	Industrial/port	Nearby	Urban	Industrial/urban	Good
E. Potomac Park	Park	Onsite	Urban	Open space	Excellent
Fifth Avenue Marina	Marine/park	Adjacent to site	Urban	Open space	Excellent
Florida State Fairgrounds	State fairgrounds	Onsite	Suburban	Urban transition	Good
Hookers Point	Industrial/port facility	Onsite	Urban/port	Industrial/urban	Excellent
Hoquiam	Industrial/manufacturing	0.2 km (0.13 mile) from site	Urban/port	Industrial/urban	Good
Patriots Point	Museum, marina, golf course, hotel	Water extended to site. Package sewage treatment plant installed.	Suburban	Commercial/ agricultural/ open space	Fair
Vicksburg	Industrial/manufacturing	Adjacent to site	Suburban	None	Good
Virginia Beach	Beachfront commercial	Adjacent to site	Urban	Residential/ commercial	Excellent
Pelican Island	Industrial/residential/ institutional/recreational	To site	Urban	Industrial/ residential/ open space	Excellent
Port Jersey	Industrial/commercial	Onsite	Urban	Industrial	Excellent
Blount Island	Industrial	To site	Suburban	Industrial	Excellent
Rivergate	Industrial	Onsite	Suburban	Manufacturing	Excellent

Table 17-3

Case Study Site Valuation Study (item 15)

Site Name	Use Considered for Valuation	Raw Value Prior to Dredged Material Placement		Adjusted Present Value		Enhancement Value	
		per ha	per acre	per ha	per acre	per ha	per acre
Anacortes	Industrial/port	$5,400/ha*	$2,200/acre	$43,700/ha	$17,500/acre	$37,800/ha	$15,300/acre
Artificial Island	Nuclear power generation	$12/ha	$5/acre	$3,200/ha	$1,300/acre	$3,200/ha	$1,300/acre
Bay Port	Heavy industrial	Nominal	Nominal	$16,100/ha	$6,500/acre	$16,100/ha	$6,500/acre
E. Potomac Park	Recreational	None		$645,900/ha	$261,500/acre	$645,900/ha	$261,500/acre
Fifth Avenue Marina	Recreational/open space	$10,800 to $26,900/ha	$4,300 to $10,900/acre	$1.94 million to $2.60 million/ha	$784,000 to $1.0 million/ acre	$1.92 million to $2.60 million/ha	$779,000 to $1.0 million/ acre
Florida State Fairgrounds	Commercial/retail	$11,100/ha	$4,500/acre	$106,300/ha	$43,000/acre	$95,100/ha	$38,500/acre
Hookers Point	Deepwater terminal facilities	Nominal	Nominal	$160,600/ha	$65,000/acre	$160,600/ha	$65,000/acre
Hoquiam	Industrial/port	$2,000/ha	$800/acre	$13,100/ha	$5,300/acre	$11,100/ha	$4,500/acre
Patriots Point	Commercial/recreational	$5/ha	$2/acre	$43,000/ha	$17,400/acre	$43,000/ha	$17,400/acre
Vicksburg	Industrial/port						
Virginia Beach	Commercial/retail	$5,600/ front m	$1,700/ front ft	$5,600/ front m	$1,700/ front ft	Maintenance value	Maintenance value
Pelican Island	Industrial/residential	$1,725/ha	$700/acre	$19,266/ha	$7,800/acre	$17,540/ha	$7,100/acre
Port Jersey	Industrial	$35,000/ha	$14,000/acre	$198,000/ha	$79,000/acre	$163,200/ha	$65,200/acre
Blount Island	Industrial	$16,055/ha	$6,500/acre	$83,360/ha	$33,750/acre	$67,305/ha	$27,250/acre
Rivergate	Manufacturing	$11,100/ha	$4,500/acre	$134,500/ha	$54,500/acre	$123,400/ha	$50,000/acre

* 1977 dollars.

Table 17-4

Case Study Sites--Associated Benefits/Adverse Impacts (item 15)

Associated Benefits/Adverse Impacts	Anacortes	Artificial Island	Bay Port	E. Potomac Park	Fifth Ave. Marina	Florida State Fairg.	Hookers Point	Hoquiam	Patriots Point	Vicksburg	Virginia Beach	Pelican Island	Port Jersey	Blount Island	Rivergate
Adjusted value increase						X	X				X				
Increased business activity			X		X	X	X				X		X		X
New jobs	X	X	X			X	X	X	X	X	X	X	X	X	X
Increased taxes/revenues	X		X		X			X		X	X				
Sales	X					X	X	X	X		X	X			X
Real estate	X	X	X			X	X		X			X	X	X	X
Community attractiveness				X	X	X			X		X				
General boost to economy	X		X			X	X		X			X		X	X
Operations revenue						X	X		X						
Provide needed community facilities				X	X	X	X						X		
Increased recreation opportunities				X	X	X			X		X	X			
Construction jobs		X					X					X	X		X
Utility taxes		X													X
Decrease in area taxes		X													
Public education (re: nuclear power plants)		X													
Increased congestion		X	X		X				X		X			X	
Higher property taxes												X			
Environmental degradation		X	X		X				X	X				X	
Increased municipal expenses															
Limits area development potential		X													
Community concern		X								X		X		X	
Detracts from adjacent vistas									X						
Improved medical care services		X													
Provide needed power		X													
Educational/cultural opportunities									X						
Expands area tourist potential									X						
Introduce alternative transportation mode							X		X		X		X	X	
Create site for administrative offices				X											X